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Atkins Bio

Dr. Daniel Atkins is the Executive Director of the Alliance for Community Technology at The University of Michigan. He is widely regarded as a national expert on computer-mediated learning, including distance learning. He was interviewed by Ken Dvorak and Ron Smith.

a) Given the bleak record of .com companies in the past eighteen months what do you see as innovative future technologies? Their impact on education?

Despite the bursting of the .com bubble, there are clear technological trends and new socio-technical changes that will continue to occur. The examples I will cite are 1) increased mobility through wireless networks, 2) increased support for the scarcity of human attention, 3) and increases in "multimedia literacy, " both reading and writing.

Although the "G3 cell phone" revolution seems stalled and perhaps misdirected, there is an inevitable trend tends toward nomadic forms of interactive information access. This is supported by the increased investment in interoperability of data services in the cell phone market as well as the rapid growth in the 802.11 technology including community-based creation of free nets. We are also seeing convergence of the cell phone and the PDA and into a new class of wireless, multimedia appliance. We have a long way to go to understand the educational impact of these technologies but early work by Elliot Soloway and others at the University of Michigan show significant potential for wireless/PDA type devices in supporting inquiry-based science education.

Although the performance of the base technology and the extent of content available through the web have grown at exponential rates, the availability of human attention remains constant. There is a great need and demand for technologies that amplify and help manage the scarce resource of human attention in the presence of severe information overload. Agent technology, even

simple agent technology, will continue to grow in importance as will technology such as automatic abstraction and summarization, recommender systems, and more powerful, visually-based browsing systems. There will be a continuing trend of creation of personal digital libraries, populated by collections from remote libraries, but organized and built for personal use and along the lines of personal needs and tastes.

Finally, we will see increased ease of use in acquiring, authoring and sharing multimedia documents/genres. The education now focuses on literacy in terms of reading and writing text. We are moving into a period where literacy will be broadened to include not only reading but routine "writing and production" of multimedia documents involving video/audio images, visualizations etc. We are in the very early stages of understanding this impact on education but it will potentially be profound.

b) Author Ray Kurzweil writes about "The Age of Spiritual Machines" when machine intelligence will exceed that of humans. Do you agree? If not, why?

I'm not an expert in artificial intelligence. I do believe that in the next decade the raw computing power of computers will approach that of the human brain. Whether or not we can harness this power to true intelligence I believe remains an open question. Even if we can approach this there will be profound social issues and issues of trust of machine intelligence particularly in the context of life or death situations. We have for example GPS technology that would allow us to build electronic corridors for airplanes to prevent them from crashing into buildings. This would however require the computer to take over control of the plane in emergency situations and even in this well-defined task; we are a long way from trusting the computer to become an emergency pilot.

There is work underway in implants of electrodes and other micro electronic and micro machine technology in the human. This would provide interface between man and machine and we could imagine some synergy between the two as an alternative to a purely artificial intelligence. This is part of the more general trend for the entire world to become and interface to the cyberworld.

c) Many education experts write about the need for "lifelong" learning. How do you see future technologies helping or hindering that process?

Our knowledge-based society increasingly requires educational renewal in the workplace. Furthermore people, especially post-retirement are seeking intellectual stimulation and renewal. All of this creates a market for lifelong learning and technology potentially provides both interactive and place independent ways of pursuing learning. My personal orientation is toward the idea of continued involvement in learning communities. This emphasizes the role of people in both contributing to and taking from a knowledge creating and disseminating process. Mediated through technology people can learn through formal coursework, exploration of cultural resources but they can also contribute as mentors, adjunct faculties and advisors to educational institutions. This could occur both during and after a person's formal employment period. In summary, technology potentially relaxes constraints of time and place to allow people to participate in

learning communities independent of specific times in their lives and specific location at physical learning facilities. It provides reciprocal opportunities for both learning and contributing and as many have said — the best way to learn is to teach.

d) What do you see as challenges and accomplishments for the generation of students now enrolled in public education?

Many of the challenges for students enrolled in public education are non-technical. They are social and economic and result to a large extent from decreased willingness of the public to fund education and an increased lack of confidence in public education. More optimistically, technology is producing a more "plug and play" generation that can learn by doing and may likely respond better to inquiry based approaches to learning. As mentioned earlier, I believe we are approaching a new era in which multimedia will increasingly become associated with legitimate literacy both in the reading and writing sense. Ideally, technology will provide students more authentic experience, constructive social activity and a meaningful sense of participation in a global village.

e) The Internet is still in its infancy. How do you see it evolving over the next 5-10 years? What do you believe it will be able to offer in terms of solid educational benefits?

The Internet began as a way of interconnecting machines, evolved to support email and file transfer, and is now a primary source of information. In the future, the Internet will increasingly be thought of as support for virtual communities – knowledge creating communities, communities of practice, communities of interest, etc. The internet will be a portal to data-information-knowledge, people, facilities for interacting and constructing things in the real world and specialized services of all sorts. The concept of "ubiquitous" computing will become more real with people potentially connected (hopefully on their own terms) to the internet continually through a variety of hand sized, desk sized and wall sized appliances.

Truly solid educational benefits will take time to evolve but in general I believe that the most profound influence will be on providing more authentic learning experiences, allowing learning and knowledge creation to take place in collaborative settings, and providing more authentic and diverse experience. Hybrid-institutions, including institutions of higher education will be formed between research universities, undergraduate schools and minority serving institutions.

We are certainly not advocating educational institutions vaporize into cyberspace. We are simply observing that the physical and place based opportunities can substantially be augmented through same and different time and place experiences made possible through computer and communication technology. How institutions use this potential for competitive advantage and how individuals use it for their personal benefit is still largely unknown. We will find solutions through experiments involving interaction between technical and social experts.

f) The National Research Council, in How People Learn, maintains that classroom configuration

has a direct impact on student learning. If we grant that this is so, what should the future classrooms look like? What technologies should be incorporated into them to enhance student learning?

Much of formal education has traditionally occurred in classrooms – physical places where people interact at the same time and place. Technology provides 3 additional potential opportunities for learning and interaction: 1) same-time/different-place (e.g. video conferencing), different-time/different- place (e.g. email discussion groups) and same-place/different-times (time-sharing a physical laboratory). The physical proximity will continue to be very important for certain learning opportunities but in addition to traditional issues of placement, size and so forth it would be important to design classrooms that provide a continuum into the electronic collaboration/information world. We need physical spaces that allow people to easily and seamlessly interact with people, information and facilities that are physically proximate as well as at a distance. We need to create electronic corridors between these physical spaces.

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